



M E O T O R E

manifesto



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LIST OF ACRONYMS

CS	Commercial Service
CS-HPPS	CS-High Precision Positioning Services
CS-NAV	CS-Navigation
DSRC	Dedicated Short-Range Communications
EC	European Commission
EDAS	EGNOS Data Access Server
EGNOS	European Geostationary Navigation Overlay Service
EU	European Union
FP	Framework Programme
GNSS	Global Navigation Satellite System
GPS	Global Positioning System
GSA	European GNSS Supervisory Authority
ICT	Information and Communication Technologies
ITS	Intelligent Transport Systems
MENTORE	iMplemENTation of GNSS tracking & tracing Technologies FOR Eu regulated domains
OS	Open Service
PRS	Public Regulated Service
R&D	Research & Development
RFID	Radio-Frequency Identification
SAR	Search And Rescue
SBAS	Satellite Based Augmentation System
SIS	Signal In Space
SoL	Safety of Life
SP	Service Provider
T&T	Tracking & Tracing
US	United States

MENTORE MANIFESTO

Today, European policies are playing a key role in the implementation and the adoption of satellite positioning technologies. The role of the European GNSS (Global Navigation Satellite System) in enabling policy-driven tracking & tracing (T&T) applications has been highlighted and demonstrated by the FP6 project **MENTORE** (iMplemENTation of GNSS tracking & tracing Technologies FOR Eu regulated domains).

MENTORE has set off [regulated tracking & tracing satellite navigation services](#) for various application domains: freight and logistics, animals and persons. For each case **MENTORE** has identified a roadmap for EGNOS (European Geostationary Navigation Overlay Service) adoption in Europe in the short-term, as a precursor to Galileo in the long-term. The MENTORE Manifesto intends to propose recommendations to EU policies under preparation, for facilitating the European GNSS introduction and exploitation.

Capitalising on the project outcomes, the Manifesto focuses on three regulated tracking & tracing applications and their related European policies:

- **DANGEROUS GOODS TRANSPORT** and the European Commission “Action Plan for the applications of EGNOS and Galileo”, whose adoption is foreseen for June 2009
- **MULTIMODAL FREIGHT TRANSPORT** and the European Commission “eFreight” policy, which is currently being elaborated
- **CITY LOGISTICS** and the European Commission “Action Plan for Urban Mobility”, whose adoption was postponed to late 2009.

The **MENTORE** Manifesto's aim is to provide food for thought to key decision-makers in the European Institutions and related Agencies involved in the drafting of the above-mentioned policies. This document details the contribution of satellite navigation to the further

development of the three regulations/policies. This Manifesto is formulated by the MENTORE team with major contributions by Antonella Di Fazio (Telespazio), Laure Dezes (European Union Road Federation), Andrea Kurz (HITEC), Mark Miller (COTECNA) and Angelo Aulicino (Interporto Bologna). The partners who carried out the work are reference stakeholders (industry, non-profit organisation, etc.) with skills in their field of expertise, namely satellite navigation application and service provision, supply chain & cargo transport, intermodal terminal operation, market and regulations. They benefited also from the complementary contributions of major actors of the freight sector who cooperated with them as external experts during the project's lifetime.

Today, a number of satellite navigation applications are enabled by the added-value features of the European GNSS services, which are currently delivered by the EGNOS system in Europe and will continue to be delivered, in the near future, by the Galileo system worldwide.

THE EUROPEAN GNSS

EGNOS is Europe's first venture into satellite navigation. It augments the US GPS and makes it suitable for applications requiring an accurate and guaranteed position. EGNOS' signal is presently available over Europe, and will offer three operational services in 2010.

The EGNOS Open Service (OS) is available to mass-market receivers for the most common user applications while Safety of Life (SoL) is offered to the safety critical transport community on the basis of enhanced and guaranteed performance that includes the provision of the integrity function, i.e. a warning system in case of malfunction that will reach the user within a given alarm time. Both OS and SoL services are based on a Signal In Space (SIS) broadcasted over Europe. The EGNOS SIS provides SoL service to any user equipped

with a SBAS (Satellite Based Augmentation System) SoL certified receiver in civil aviation, while providing OS to other users for free. In addition to these services, EGNOS provides Commercial Service (CS) enabling land applications for professional markets in Europe. The CS is based on the use of EGNOS data disseminated by EDAS (EGNOS Data Access Server). For the regulated tracking & tracing markets, the added value is the provision of guaranteed positioning.

Galileo will deliver OS, SoL and CS services with enhanced performance for SoL and CS in terms of accuracy, integrity and service guarantee. The package of services will be completed with Public Regulated Service (PRS) and Search And Rescue (SAR). PRS counts on a set of protected access signals to enable authorised users to continue receiving Galileo SIS, even during critical times (crisis, war, etc), while SAR will allow important improvements in the existing system for humanitarian search & rescue activities.

MENTORE

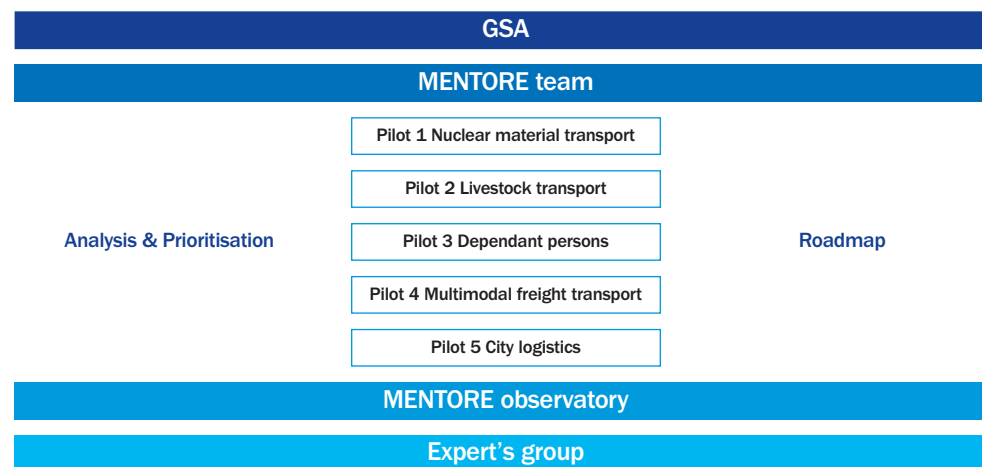
MENTORE is a project co-funded by the European GNSS Supervisory Authority with funds from the FP6 of the European Commission. MENTORE began in July 2007 and is going to end in July 2009. Following an in-depth analysis of the present European regulatory and policy framework, user needs and service requirements, the project implemented five live demonstrations using the EGNOS SIS presently available over Europe:

- T&T services for nuclear material transport
- T&T services for livestock transport

- T&T services for dependent persons
- T&T services for multimodal freight transport
- T&T services for city logistics.

MENTORE has created a shared understanding of how technological and regulatory factors support the widespread usage of the EU GNSS, as a tool to monitor and control the position of assets, animals and people. MENTORE has demonstrated the added value of EGNOS/Galileo in the above-mentioned tracking & tracing applications, and has assessed the main enablers that facilitate its introduction and exploitation.

MENTORE Consortium relies on 18 core partners representing the main actors of each application's value chain: GNSS technology companies, market and regulatory experts, equipment manufacturers, application providers, service providers, users. Moreover, external experts with specialised know-how on the various user domains contributed, when necessary, to the projects' activities. The MENTORE "Application and Regulatory Observatory" served as a platform for the exchange of ideas.



Today, MENTORE's results provide indications on how the EU GNSS can be integrated into National and European regulations and policies currently being prepared. Recommendations and suggestions for actions to decision-makers are based on the solid knowledge of the project consortium and its external experts, with the active support of the GSA.

EGNOS/GALILEO SERVICES FOR REGULATED TRACKING & TRACING

“Tracking & Tracing” targets a set of services for **land applications**, requiring the knowledge of the position of assets or persons, provided by satellite navigation technologies. The availability of EGNOS over Europe, as a precursor of Galileo over the world, enables T&T services based on guaranteed positioning. In accordance with the European Commission **“GREEN PAPER on Satellite Navigation Applications”**, these services can support the implementation of regulations and policies requiring precise and reliable positioning: the **Regulated T&T** services. Regulated T&T services address various niche markets and a wide range of applications in the transport and personal mobility sectors. The most relevant benefits from these services are **public and social**; however they also imply commercial interests.

A number of best practices adopted at National or European levels are presently operational using GPS positioning. However, EGNOS’ added value, compared to GPS, relies on its ability to provide **guaranteed positioning** and EGNOS-assisted functions via a downstream Service Provider (SP). In the freight transport sector MENTORE identified the most interesting applications for Regulated T&T services: **Dangerous goods transport, Multimodal freight transport, and City logistics**.

For these applications the market shows clear needs and requirements and is sufficiently mature to use EGNOS-based services. EGNOS has evident opportunities in the short-term in Europe, and in addition prepares the global market for Galileo.

Solutions have been developed and proven in various Research & Development (R&D) projects. The elaboration and adoption of policies and a suitable regulatory framework at National or European levels are expected to trigger the introduction and exploitation of EGNOS/Galileo Regulated T&T services.

In this respect, the Public sector plays a fundamental role. It can stimulate the market by implementing actions involving the key stakeholders.



EGNOS COMMERCIAL SERVICE NEW OPPORTUNITIES FOR REGULATED TRACKING & TRACING

Opportunities of EGNOS for land applications rely not only on the signal coming from the satellite (OS), but also on the distribution of EGNOS data via EDAS (CS). EDAS is a server that gets the raw data directly from the EGNOS system and distributes it to SPs in real time, within a guaranteed timeframe and in a secure and reliable manner. Downstream SPs connect to EDAS to get EGNOS data, and implement solutions to create value added services: they can deliver EGNOS data via different telecommunication means and/or products built on it. Two classes of products can be implemented on EGNOS data processing: **CS-HPPS** (CS-High Precision Positioning Service) and **CS-NAV** (CS-Navigation).

The CS-HPPS targets High Precision Positioning users. It is based on the distribution of historical and real time data collected from the EGNOS monitoring reference network, which are used by the SP or directly by the users as GPS Differential reference stations. The CS-NAV targets the provision of value added services built on the processing and distribution of the EGNOS Navigation Message via different telecommunication means. **It augments the continuity of EGNOS OS and exploits the value of the EGNOS integrity** (e.g. in urban areas, generally affected by lack of SIS continuity due to limited sky visibility). Such a value relies on a **guaranteed positioning** linked to the provisioning of a **Protection Level** that defines the level of confidence of the position.



The user receives the EGNOS accurate position, velocity & time, plus the “circle” in which the position is guaranteed. Regulated T&T can benefit from the use of **EGNOS CS, thanks to the SP service offer based on CS-NAV added value: EGNOS high accuracy, combined with the continuity and Protection Level information**, enables the stakeholders and Authorities to use GNSS to support regulation implementation.



NAME	DESCRIPTION	REFERENCE MARKET	VALUE FOR THE USER	
CS-HPPS	Distribution of historical and real time data collected from the network of EGNOS reference stations	High precision positioning professional users	Availability of raw GPS data collected by the EGNOS monitoring reference network	HIGH PRECISION
CS-NAV	Processing and distribution of the EGNOS navigation message via different telecommunication means	Professional regulated markets	<ul style="list-style-type: none"> Enhanced availability of EGNOS service Use of EGNOS integrity (protection level) 	SERVICE GUARANTEE AND AUGMENTATION OF AVAILABILITY



DANGEROUS GOODS TRANSPORT

SET A PRIORITY IN THE EC "ACTION PLAN FOR EGNOS AND GALILEO"

Transport of dangerous goods is among the most promising markets for EGNOS and the most ready to welcome this new technology. EGNOS introduction in this market is driven by the need for tracking & tracing as a tool to enhance transport efficiency and above all to ensure public safety. Best practices based on GPS are presently running in a few European countries involving key stakeholders. However, the need for a guaranteed positioning by the Authorities, goods owners and transport operators can also be satisfied with CS-NAV services. Currently some prototype EGNOS CS-NAV solutions are being successfully tested in live operations.

Two priority actions shall be implemented in the short-term to foster EGNOS/Galileo use, involving all key players:

- Evolution of technology and services evolution from prototype to standardised products
- Preparation of a legislative framework, including rules

for liability, data exchange/sharing, operations and procedures.

The role of **National Authorities** is to facilitate and accelerate the regulatory process.

From the implementation viewpoint, today's best practices at National level will most likely be the driver behind any introduction strategy at European level. National Authorities should carry out the standardisation process, in combination with the legislative policy implementation.

A best practice programme, consisting of existing National schemes using EGNOS could pave the way for a EU-wide introduction to:

- Ensure large scale use
 - Extensively validate EGNOS CS-NAV solutions in live operations
 - Initiate technical standardisation
 - Define and validate the commercial exploitation and marketing plan
 - Feed the regulatory process.
- Parallel activity should be carried out at European level to define

a harmonised framework, starting from neighbouring countries and gradually extending to other Member States. The **Public sector has a fundamental role to play** by incorporating the outcomes of the EGNOS best practise programme in its policy formulation. This is an aspect the European Commission should highly consider when preparing the **Action Plan on EGNOS and Galileo** foreseen to be released by the end of 2009.



MULTIMODAL FREIGHT TRANSPORT

IMPLEMENT THE FUTURE ITS DIRECTIVE TO STRENGTHEN THE eFREIGHT POLICY

Multimodal freight transport is a huge market, combining many operational phases which require efficient data exchanges and involve different actors and needs. In terms of tracking & tracing of goods, existing technologies including GPS are used on a best practice basis by commercial operators to optimise and enhance the safety of their transport activity. In this context, opportunities exist for EGNOS and Galileo as they will open new doors that go beyond the present services. [These opportunities depend on the maturity of the locating devices and rely on an adequate policy framework to ensure feasible business cases.](#) For T&T applications, the added value of the EGNOS CS-NAV is its ability to provide a guaranteed positioning, which enables the implementation of eFreight and eCustoms policies. [The short-term opportunities for EGNOS CS-NAV are twofold:](#)

- To support the eFreight and linked policies such as eLogistics, in line with the EC Freight Logistics Action Plan and the ITS (Intelligent Transport System) Action Plan Directive

- To provide value added services, such as tampering monitoring (in case of integration with sensors) and high precision positioning services (in case of combination of CS-HPPS and CS-NAV).

Despite a coverage limited to Europe, EGNOS use is recommended for eCustoms in order to prepare the global market for Galileo in terms of technical solutions, operative procedures and regulatory framework. This way, Galileo opportunities, which are linked to its global coverage and capability to provide signal authentication, can be fully exploited with eCustoms. [In this context, the actions of the European Institutions towards an efficient market strategy for EGNOS/Galileo in the multimodal freight transport sector should combine a technical and policy approach:](#)

- R&D activities to support the evolution from prototypes locating devices to standardised products
- [Policies under preparation to take into consideration the ITS Action Plan which requires](#)

«the definition of the necessary measures to use innovative ITS technologies in the realisation of ITS applications for freight transport logistics (eFreight)», in particular, the eFreight policy. eFreight, whose preparation started in February 2009, can play a fundamental role in supporting the introduction and adoption of the EU GNSS in the targeted market.

[The following recommendations should be taken into account:](#)

- [Pushing towards the use of the EU GNSS in combination with other locating technologies](#) (such as RFID - Radio-Frequency Identification, DSRC - Dedicated Short-Range Communications and Differential GPS)
- Enabling the seamless extension to other T&T services (such as dangerous goods, perishables, high-value goods), offered as a package, in order to ensure the business plans' viability
- Developing a dedicated approach different from urban freight mobility scenarios, in order to target proper actors and decision makers, and business models.

CITY LOGISTICS

RELEASE THE "ACTION PLAN ON URBAN MOBILITY" FOR AN INTEGRATED GNSS-BASED ITS

City logistics aims to provide efficient and environmentally-friendly distribution systems in urban areas. The role of ICT (Information and Communication Technologies) and ITS is of crucial importance to make this process successful. However, the implementation of an urban distribution model depends on the municipalities' local specificities as well as their willingness to make use of existing best practice schemes.

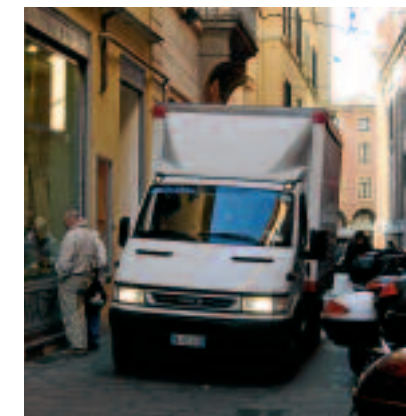
At present, only a few cities employ ITS solutions and GPS technology for the sustainable mobility of trucks/vans circulating in urban areas. MENTORE has demonstrated, for the city logistics application in Bologna, that guaranteed positioning provided by the use of EGNOS CS-NAV supports the implementation of traffic limitations and law enforcement. In this context, [local frontrunner experiences involving municipalities, fleet operators and technology providers will likely serve as references](#) and trigger the EU GNSS introduction at European level. In spite of the predominant role

of local Authorities, [the European Institutions should also play their part by releasing the much-anticipated Action Plan on Urban Mobility as soon as possible.](#) This document should specifically support the introduction of GNSS-based ITS for urban mobility applications, in particular for regulated fleets. The active lobby of some European associations such as POLIS and EUROCITIES drives towards a common goal.

[Priority actions lie in:](#)

- The European Commission adopting a future Action Plan on Urban Mobility which makes clear reference to satellite technologies as a technological option for city logistics (but preventing confusion with eFreight which targets a different set of stakeholders)
- Local Authorities pushing towards the implementation of the actions identified by the Action Plan
- European, National and local Authorities encouraging the development of local public-private partnerships

between urban freight and logistics operators, to decrease the costs. In addition, R&D should add tangible value and open real business opportunities to EGNOS services by elaborating service bundling systems (linked with urban regulated fleets) and testing them within live large scale demonstrations.



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